EXHIBIT E

Appl. No. 13/209,276
Amdt. dated February 20, 2013
Reply to Office Action of November 20, 2012

Attorney Docket No.: 22773-774.301

REMARKS

This paper is responsive to the Final Office Action mailed November 20, 2012. Upon entry of this amendment, claims 1, 43-45, 47-54, 56-63, and 65-68 will be pending in the present application. Claims 46, 55, and 64 have been canceled. Claims 1, 45, 47-51, and 60 have been amended. Support for the amendments can be found in the specification as originally filed – accordingly, no new matter has been added. Reconsideration in view of the foregoing amendments and the following remarks is respectfully requested.

Election/Restriction

Reconsideration of the withdrawal from consideration of claims 51-68 is respectfully requested. Per MPEP 803, restriction is proper only if the claims recite independent or distinct inventions **and** search and examination of all the claims in the application cannot be made without serious burden on the examiner. In this instance, claims 51-68 recite systems and storage mediums directed to accomplishing similar acts to those recited in method claims 1, 43-45, and 47-50. As such, it is respectfully submitted that examination of claims 51-68 can be made without serious burden on the examiner. Moreover, the present response submits similar amendments to each of the independent claims 1, 51, and 60, thereby increasing the similar nature of the claims.

Claim Rejections – 35 USC § 101

Claims 1 and 43-50 stand rejected under 35 U.S.C. 101 as allegedly directed to non-statutory subject matter. On page 4 of the Office Action, the following is stated:

> The scope of claim 1 is broad, and does not require the use of a specific machine, as the claim requires only that the steps be performed "by a host computer." The mere inclusion of a host computer does not adequately specific nor provides a meaningful limitation of the claim. Further, there is no particular article that is transformed in carrying out the steps of the claimed method. Therefore, it is determined that the recitation of the host computer is insufficient to direct the claim to statutory subject matter as the computer is merely an object on which the method operates. The significant acts of the method can be performed entirely in the mind.
>
> As the inclusion of the general-purpose host computer is insufficient to provide a meaningful limitation to the claim, the claim covers substantially every practical application of a method for staging the movement of a plurality of dental objects.

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Applicants respectfully disagree with the rejection of claims 1 and 43-50 under 35 U.S.C. 101 for numerous reasons. Claim 1 does not merely recite a host computer as implied in the above-excerpted portion of the Office Action. Instead, claim 1 recites a computer-implemented method for staging the movement of dental objects in which particular electronic representations of each of the dental objects are received and used to determine a particular order of movement for each dental object. The received data is transformed, using the computer, to generate the recited order of movement for each dental object. While it is implied in the Office Action that transformation of a particular article is required to be patentable, the applicable case law indicates otherwise. Specifically, a claim that purportedly lacks any "physical steps" but is still tied to a machine (as is clearly the case in claim 1) or achieves an eligible transformation passes muster under §101. (see, *e.g.*, *In re Bilski*, 88 USPQ2d 1385, 1396 and n.25 (Fed. Cir. 2008), "Thus, it is simply inapposite to the §101 analysis whether process steps performed by software on a computer are sufficiently "physical.""). In the case of claim 1, it is respectfully submitted that the recited acts are both tied to a machine and achieve an eligible transformation, thereby passing muster under §101 on either basis.

Claims 43-45 and 47-50 depend from claim 1 and therefore are also directed to statutory subject matter. As noted above, claim 46 has been canceled.

Accordingly, for the reasons set forth above, withdrawal of the rejection of claims 1, 43-45, and 47-50 under 35 U.S.C. 101 is respectfully requested.

Claim Rejections – 35 USC § 112

Claims 1 and 43-50 stand rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as allegedly indefinite. Specifically, the recitation of "an optimal number of stages" is identified as rendering the claim unclear.

Without conceding the merit of the rejections, the claims have been amended to eliminate the recitation of "optimal" so as to expedite prosecution. Additionally, as noted above, claim 46 has been canceled.

Accordingly, withdrawal of the rejection of claims 1, 43-45, and 47-50 under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA) is respectfully requested.

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Double Patenting

Claim 1 stands rejected under 35 U.S.C. § 101 as allegedly claiming the same invention as that of claim 5 of prior U.S. Patent No. 8,038,444 (hereinafter the '444 patent). Claims 43-46 and 48-50 stand rejected on the ground of nonstatutory obviousness-type double patenting as allegedly obvious over claims 2-4 and 12-14 of the '444 patent. Claim 47 stands rejected on the ground of nonstatutory obviousness-type double patenting as allegedly obvious over claim 5 of the '444 patent, in view of *Chishti et al.* (US 2004/0137400).

The obviousness-type double patenting rejections are acknowledged and will be addressed upon final resolution of the claims, *e.g.*, by filing a terminal disclaimer, if necessary.

Claim Rejections – 35 USC § 102 and § 103

Claims 1, 43-45, 47 and 48 stand rejected under 35 U.S.C. 102(b) as allegedly anticipated *Chishti et al.* (US 2004/0137400). Claim 46 stands rejected under 35 U.S.C. 103(a) as allegedly obvious over *Chishti*. Claim 49 stands rejected under 35 U.S.C. 103(a) as allegedly obvious over *Chishti* in view of *Chishti et al. II* (US 6,682,346).

Without conceding the merit of the rejections, the claims have been amended to expedite prosecution. It is respectfully submitted that the cited references, either alone or in any combination, fail to disclose or suggest all the elements recited in the claims, thereby precluding rejection based on either anticipation or obviousness.

Claim 1 recites a computer-implemented method for staging the movement of a plurality of dental objects. By determining the minimum number of stages necessary to move each of the dental objects, as well as the number of non-movement stages for each of the dental objects, data is obtained that enables selection of an overall minimum number of stages for the order of movement of the dental objects.

Chishti, while representing a considerable advancement in the art, fails to disclose or suggest all the elements recited in claim 1. For example, *Chishti* fails to disclose *"... determining, using the host computer, an order of movement for each respective dental object such that ... a number of stages is calculated for the order of movement for each respective dental object, wherein calculating the number of stages includes:* **determining a total distance _each respective dental object_ will move; dividing the total distance for _each_**

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*dental object by its respective maximum speed to determine a number of movement stages
for each dental object; determining a number of non-movement stages for each respective
dental object; adding the number of movement stages to the number of non-movement
stages for each dental object to determine a minimum number of stages for each respective
dental object; and selecting the largest of the minimum numbers of stages*" as recited in
claim 1. Moreover, it is respectfully submitted that the rationale stated in the Office Action
in support of the rejection of dependent claim 46 ("[s]imple arithmetic and the knowledge
that the process can only proceed as fast as the rate-limiting step amount to common sense
well within the level of ordinary skill in the art") fails to specifically address each of the
above-emphasized acts recited in claim 1.

   Chishti II fails to remedy the above-noted deficiencies of *Chishti*. *Chisti II*
discloses defining tooth-moving appliances computationally. (Title). While representing a
considerable advancement in the art, *Chishti II* also fails to disclose the above-emphasized
claim 1 elements, which are not disclosed by *Chishti*. Thus, claim 1 is allowable over the
cited references.

   Claims 43-45 and 47-50 depend from claim 1 and are therefore also allowable
over the cited references for the same reasons as for claim 1, as well as on their own merits.
Independent claims 51 and 60 recite elements similar to the above-discussed claim 1
elements and are therefore also allowable over the cited references for the same reasons as
for claim 1, as well as on their own merits. Claims 52-54 and 56-59, and claims 61-63 and
65-68, depend from claims 51 and 60, respectfully, and are therefore also allowable over the
cited references for the same reasons as for claim 1 as well as on their own merits. As noted
above, claims 46, 55, and 64 have been canceled.

   Accordingly, withdrawal of the rejections of claims 1, 43-45, 57-54, 56-63,
and 65-68 under 35 U.S.C. 102(b) and 103(a) is respectfully requested.

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CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

Further, the Commissioner is hereby authorized to charge any additional fees or credit any overpayment in connection with this paper to Deposit Account No. 23-2415.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 206-883-2500.

Respectfully submitted,

Dated: February 20, 2013   /Mark T. McMaster/

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Amendments to the Claims:

Please amend claims 1, 45, 47-51, and 60; and cancel claims 46, 55, and 64 as set forth below.

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

       1.   (Currently Amended) A computer-implemented method for staging the movement of a plurality of dental objects, the method comprising:

       receiving, at a host computer, an electronic representation of each dental object of the plurality of dental objects in relation to one another, each dental object being in a respective initial position;

       receiving, by the host computer, an electronic representation of a corrected position for each respective dental object; and

       determining, using the host computer, an order of movement for each respective dental object such that (1) the dental objects avoid colliding with or obstructing each other on their respective routes from their respective initial position to their respective corrected position through at least one of staggering and round-tripping of at least one dental object; and (2) ~~an optimal~~ a number of stages is calculated for the order of movement for each respective dental object, wherein calculating the number of stages includes:

            determining a total distance each respective dental object will move;

            dividing the total distance for each dental object by its respective maximum speed to determine a number of movement stages for each dental object;

            determining a number of non-movement stages for each respective dental object;

            adding the number of movement stages to the number of non-movement stages for each dental object to determine a minimum number of stages for each respective dental object; and

            selecting the largest of the minimum numbers of stages.

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2-42.　(Canceled)

43.　(Previously Presented) The computer-implemented method of claim 1, wherein determining the order of movement, comprises:

(a) determining a route that each respective dental object will move to achieve its respective corrected position;

(b) determining the distance each respective dental object will move to achieve its respective corrected position; and

(c) determining a rate at which each respective dental object will move along its respective route.

44.　(Previously Presented)　The computer-implemented method of claim 43, further comprising determining (a), (b) and (c) in relation to each of the other dental objects.

45.　(Currently Amended)　The computer-implemented method of claim 44, wherein determining (a), (b) and (c) in relation to each of the other dental objects step comprises adjusting at least one of the route and the rate of at least one dental object to avoid collision with at least one other dental object.

46.　(Canceled)

47.　(Currently Amended)　The computer-implemented method of claim 1, wherein determining the order of movement step comprises determining a schedule for moving each dental object in the plurality of dental objects.

48.　(Currently Amended)　The computer-implemented method of claim 1, wherein determining the order of movement step comprises staggering the movement of at least two dental objects.

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49.   (Currently Amended) The computer-implemented method of claim 1, wherein determining the order of movement step comprises round tripping at least two dental objects.

50.   (Currently Amended) The computer-implemented method of claim 1, wherein determining the order of movement step comprises slowing the movement of at least one dental object.

51.   (Currently Amended) A system for staging the movement of a plurality of dental objects, the system comprising:

a computer comprising a display, processor, and storage media comprising instructions that, when executed, cause the computer to:

receive an electronic representation of each dental object of the plurality of dental objects in relation to one another, each dental object being in a respective initial position;

receive an electronic representation of a corrected position for each respective dental object;

determine an order of movement for each respective dental object such that the dental objects avoid colliding with or obstructing each other on their respective routes from their respective initial position to their respective corrected position through at least one of staggering and round-tripping of at least one dental object; and

calculate an optimal a number of stages for the order of movement for each respective dental object, wherein the instructions causing the computer to determine the number of stages comprise instructions to:

determine a total distance each respective dental object will move;

divide the total distance for each dental object by its respective maximum speed to determine a number of movement stages for each dental object;

determine a number of non-movement stages for each respective dental object;

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add the number of movement stages to the number of non-movement stages for each dental object to determine a minimum number of stages for each respective dental object; and

select the largest of the minimum number of stages.

52.   (Previously Presented) The system of claim 51, wherein the instructions causing the computer to determine the order of movement further comprise instructions to:

(a) determine a route that each respective dental object will move to achieve its respective corrected position;

(b) determine the distance each respective dental object will move to achieve its respective corrected position; and

(c) determine a rate at which each respective dental object will move along its respective route.

53.   (Previously Presented) The system of claim 52, wherein the instructions causing the computer to determine the order of movement further comprise instructions to:

determine (a), (b) and (c) in relation to each of the other dental objects.

54.   (Previously Presented) The system of claim 53, wherein the instructions causing the computer to determine (a), (b) and (c) in relation to each of the other dental objects adjust at least one of the route and the rate of at least one dental object to avoid collision with at least one other dental object.

55.   (Canceled)

56.   (Previously Presented) The system of claim 51, wherein the instructions causing the computer to determine the order of movement comprise determining a schedule for moving each dental object in the plurality of dental objects.

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57. (Previously Presented) The system of claim 51, wherein the instructions causing the computer to determine the order of movement comprise staggering the movement of at least two dental objects.

58. (Previously Presented) The system of claim 51, wherein the instructions causing the computer to determine the order of movement comprise round tripping at least two dental objects.

59. (Previously Presented) The system of claim 51, wherein the instructions causing the computer to determine the order of movement comprise slowing the movement of at least one dental object.

60. (Currently Amended) A machine-readable storage medium having stored thereon instructions for staging the movement of a plurality of dental objects, the instructions when executed by a processor, causing the processor to:

receive an electronic representation of each dental object of the plurality of dental objects in relation to one another, each dental object being in a respective initial position;

receive an electronic representation of a corrected position for each respective dental object; and

determine an order of movement for each respective dental object such that the dental objects avoid colliding with or obstructing each other on their respective routes from their respective initial position to their respective corrected position through at least one of staggering and round-tripping of at least one dental object; and

calculate an optimal number of stages for the order of movement for each respective dental object, wherein the instructions causing the processor to determine the number of stages comprise instructions to:

determine a total distance each respective dental object will move;

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divide the total distance for each dental object by its respective maximum speed to determine a number of movement stages for each dental object;

determine a number of non-movement stages for each respective dental object;

add the number of movement stages to the number of non-movement stages for each dental object to determine a minimum number of stages for each respective dental object; and

select the largest of the minimum number of stages.

61.   (Previously Presented) The machine-readable storage medium of claim 60, wherein the instructions causing the processor to determine the order of movement further comprise instructions to:

(a) determine a route that each respective dental object will move to achieve its respective corrected position;

(b) determine the distance each respective dental object will move to achieve its respective corrected position; and

(c) determine a rate at which each respective dental object will move along its respective route.

62.   (Previously Presented) The machine-readable storage medium of claim 61, wherein the instructions causing the processor to determine the order of movement further comprise instructions to:

determine (a), (b) and (c) in relation to each of the other dental objects.

63.   (Previously Presented) The machine-readable storage medium of claim 62, wherein the instructions causing the processor to determine (a), (b) and (c) in relation to each of the other dental objects adjust at least one of the route and the rate of at least one dental object to avoid collision with at least one other dental object.

64.   (Canceled)

65.   (Previously Presented) The machine-readable storage medium of claim 60, wherein the instructions causing the processor to determine the order of movement comprise determining a schedule for moving each dental object in the plurality of dental objects.

66.   (Previously Presented) The machine-readable storage medium of claim 60, wherein the instructions causing the processor to determine the order of movement comprise staggering the movement of at least two dental objects.

67.   (Previously Presented) The machine-readable storage medium of claim 60, wherein the instructions causing the processor to determine the order of movement comprise round tripping at least two dental objects.

68.   (Previously Presented) The machine-readable storage medium of claim 60, wherein the instructions causing the processor to determine the order of movement comprise slowing the movement of at least one dental object.